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ABSTRACT

The Internet consists of several services that, when combined, can recreate and enhance the interaction possible in teacher education. This paper discusses the strengths and limitations of several computer mediated communication (CMC) technologies available through the Internet, in three categories: (1) one-way CMC (World Wide Web, graphics, audio, video); (2) two-way asynchronous CMC (e-mail, mailing lists, message boards); and (3) two-way synchronous CMC (chat, audio conferencing, video conferencing). One-way CMC serves as the foundation for a course delivered via the Internet; lessons on the Web carry the content for the students to discuss, and the Web can also be used by the self-motivated teacher to find materials for lesson plans, student activities, and personal enrichment. The addition of two-way asynchronous CMC to a Web-based course adds a necessary element for staff development; the ability to question and interact with instructor and peers is essential in any course taken by an educator. Two-way synchronous CMC provides for the instantaneous exchange of ideas. (Contains 18 references.) (AEF)

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Human Interaction During Teacher Training Courses Delivered Via The Internet

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Abstract: As teachers return for advanced degrees and universities explore alternative delivery methods involving the Internet, learning needs of professional educators must be considered. Interaction among participants is essential to the learning process. This paper reviews various methods of fostering interaction in distance learning courses.

Introduction

More teachers are seeking advanced degrees as colleges have become more willing to work with alternative scheduling. Administrators at universities see distance education as a viable alternative because it increases enrollment with less utilization of physical space. Alternative methods of delivery are attracting new audiences including the disabled, those with full time jobs who are far from the university and the children of baby boomers. Students are now more flexible in how they obtain on education and more demanding of the quality of the content of those educational opportunities. (Berge & Collins 1995b; Kaplan 1997; Nalley 1995)

Teaching and learning has traditionally been face-to-face; an apprentice with a master or rows of desks with the teacher in front. As technology increases, the distance between teacher and learner; and between co-learners often increases as well. Correspondence courses of the mid-1800s brought a chance at education to people far from population centers. These courses allowed people to learn about specific subjects and earn college degrees through the mail. In the 1930s, a new perspective was added through the use of radio and subsequently television. This allowed the students to see their teachers and observe demonstrations. In the 1980's, satellites and VCRs added more range to one way visual interaction (Lewis, Whitaker, & Julian 1995; Mortensen, Hubbard & Rodgers 1997)

When professional educators continue their education, the interaction between colleagues is essential. The sharing of experiences enhances the learning process in educators (Moonen & Voogt 1997). Muscella, Hockstader & Shapiro (1997) claim that "for teachers to adopt and sustain new approaches to pedagogy requires that they work in collaboration and have ongoing opportunities to talk about the content and craft of teaching." Kearsley (1998) claims that "The single most important element of successful online education is interaction among participants." and that the "sharing of ideas is one of the most powerful aspects of online education." Though a built in support system is available, a typical at school inservice training session and follow-up may have little infusion of new ideas. Graduate level education courses offered by colleges allow teachers from various school districts to interact, but distance and time often limit the number of teachers who can attend.

Distance education is a solution that is growing in popularity. However, when teachers are taught at a distance, chances for the essential interaction is lost. Two-way audio and two-video may return some interaction to distance education, but many schools in rural or low-income areas cannot access quality technology. However the influx of the Internet into the public schools is creating another avenue that will allow the interaction and collaboration between student and instructor and between peers to be revitalized in courses taught at a distance.

Kearsley (1998) defines online education as "any form of learning/teaching that takes place via a computer network." In the introduction to their three-part series called Computer Mediated Communication

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and the Online Classroom, Berge and Collins (1995a) state that CMC has two roles "(a) generating improved technological tools that allow classes to use a fuller range of interactive methodologies, and (b) encouraging teachers and administrators to pay more attention to the instructional design of courses." CMC can restore the feeling of community that is often developed in a classroom of teachers.

The Internet consists of several services, that when combined, can recreate and enhance the interaction possible within the classroom walls. The World Wide Web (WWW) can make these interactions simpler than in the past because all of the services can be accessed through one software package, a Web browser. Some computer mediated communication (CMC) software will be discussed here, how it can enhance teacher training course delivered via the World Wide Web, each type of software's strengths, limitations and roadblocks to deployment.

Delivery mechanisms

For purposes of this discussion, the communication technologies available through the WWW will be divided into three categories: one-way, two-way asynchronous and two-way synchronous. The one-way group includes technologies that allow the instructor to deliver the content. Two-way asynchronous technologies includes software that allows two-way communication where time is not a factor while two-way synchronous communication requires that participants be online at the same time allowing for "real time" interaction.

One way CMC

One way CMC includes a variety of media that allow the instructor to deliver content via the World Wide Web (WWW) which can include text, embedded graphics, audio and video files. Each will be discussed along with strengths and limitations.

World Wide Web (WWW)

Web browsers allow people from almost anywhere with any type of computer to access the same information. Access can also be limited to class members by adding password-protected pages.

Content can be linear or branching allowing for tutorial-like lessons. Links to other WWW resources encourages students to do additional research on their own. Instruction can be added to or modified at any time. The format of the Web allows for the combination of text and graphics displayed in a web browser. With additional software, sound and video can be added. The ability to combine media makes the Web an ideal means for delivery of course materials.

Graphics

Photos and other graphics enhance any lesson presentation by adding variety and clarification. Images can be viewed within most web browsers. However, the speed at which a web page is loaded depends largely on the size of the graphics. The quality of the graphic depends on several factors including method of creation, type of graphic and amount of compression. In many courses, clear, detailed graphics are essential to the course content.

Audio

Audio files cannot be directly but require additional software to be linked within the browser. Audio can be used to explain a graphic or deliver an entire lecture. Developing technologies allows students to listen to a class lecture at the same time it is being given in a different location. For both pre-recorded and live audio files, quality depends on recording method and quality, speed of the computer connection, quality of the receiving computer components and activity on the Internet at the time of download.

Video

Video segments can be included to capture the body language of the instructor or to illustrate parts of the lesson. Video clips can enhance a course delivered via the Internet by creating virtual field trips. Video may also be viewed live with the use of additional software. Video delivery via the Internet requires

that the receiving computer have sufficient memory and speed.

Discussion

The one-way technologies can create a content rich web-delivered course. When used together (i.e. an audio explanation of a graphic, a video clip of the teacher demonstrating the steps with the steps outlined on the web page, or a self-propelled presentation with voice over) they are a powerful medium. However, Lai (1997) warns that the web should be more than "an electronic lecture-notes turner" or the self paced CAI of the 70's. The web has the capability to add the interactivity that teachers need in a learning situation.

Two-way asynchronous CMC

Two-way CMC adds the interactivity that is necessary in distance courses delivered to teachers. The asynchronous technologies do not require the learners to be online at the same time. Each will be discussed along with strengths and limitations.

Electronic Mail (Email)

Email allows for the exchange of ideas. Email can be a one-to-one or one-to-many interchange. In an educational setting, email can be used to send out notes to the entire class, ask questions of the instructor or of classmates or to turn in assignments. The biggest drawback for the use of email seems to be either students use it or they don't (i.e. too much or none). Some feel shy with the unfamiliar technology and email customs, while others feel free to ask questions of the instructor that they would not normally in a classroom setting. To facilitate email communication, a list of email addresses needs to be distributed early in the course and then an early assignment requiring an email to the instructor and to the group needs to be given.

Mailing Lists

The content of contributions in a mailing list also appears in one's email. However, when a person sends a message to a mailing list, it is distributed to everyone on the list. Mailing lists can be used to facilitate group discussions. Everyone can read the submitter's comments on a topic. Drawbacks include: some people may not contribute because everyone will be able to read what they have submitted while others deal with so much email that the class material may get lost in the magnitude.

Message Boards

Message boards are similar to mailing lists in that everyone can read and comment on what others have contributed. However, items contributed to a bulletin board are not delivered to an email account. The students have to navigate to a central location where the messages are posted. This creates the major disadvantage. If there is no motivation or reminders to visit the site, little discussion will occur.

Discussion

These three technologies remain the best electronic means of communication and discussion. They are easily taught to beginners and provide an effective means of creating interaction within groups of teachers.

Two Way Synchronous CMC

Two way synchronous CMC allows for more interaction but requires students to be online at the same time. Each will be discussed along with strengths and limitations.

Chat

Chat groups allow students to type messages to others in a virtual "room" and the message will appear on everyone's screen almost instantaneously. Chats allow for open discussion and instant feed back on ideas, but it requires a set time for meetings.

Audio Conferencing

Audio conferencing is similar to a phone call over the Internet. This method will allow two people to exchange ideas in a voice mode in real time. Currently both parties need to have the same software and

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know the other's Internet Protocol (IP) address. Often with dial-up Internet service providers the IP address is assigned dynamically and is invisible to the user. Software, IP address identification and limitation to two-party communications are impediments to use of audio conferencing to increase interactivity in a course. Audio conferencing adds the capability to hear the inflections in the other party's voice.

Video Conferencing

Video conferences have the same advantages and disadvantages as audio conferencing. An additional advantage is being able to see the person or group with whom the student is communicating. Body language adds to the overall communication. Disadvantages include the extra bandwidth required to carry the image slows the communication or the image may be of poor quality distracting from the message.

Discussion

The main advantage of two-way synchronous CMC is the feeling of an in-person discussion. Questions are asked and answered as if the participants were in the same room. Disadvantages include the fact that participants need to be available at the same time and able to log on to the Internet. Often schedules conflict or the equipment may cause a missed meeting. Another disadvantage may be that the answers are instantaneous and may not involve in-depth thought. Follow up discussion could be left to the asynchronous methods of CMC.

Discussion

Knapczyk and Rodes (1995) suggest that professional development needs to be on-going and not the "sit and git" one shot inservice of the past. They suggest that the most practical method for the training is a cooperation between school districts and universities via some means of distance education.

The largest problem inhibiting the use of distance education at the university level is faculty buy-in. There appears to be a lack of administrative support at many universities. An instructor from New Zealand stated that at her university, instructors at a distance are paid less per course (Campbell, 1997). Concerns of faculty include time to develop, deliver and support the courses, class size, and their own skill level in course development. Kaplan (1997) suggests that universities have an inexpensive, dedicated labor force in their own students. The instructor would be the content expert and the student the designer.

Concerns about CMC from the student's side include lack of technical skills (hardware and software), difficulty with self expression and writing skills. (Aronin,1992; Kaplan, 1997; Nalley, 1995). There are also myths to be overcome on both the student and teacher side of distance education. Kearsley (1998) lists these misconceptions about distance education: it is sterile and impersonal, it is only for "techies" or that these classes are easier than the regular class.

All of the teacher training (preservice, inservice and graduate) courses described in this paper (Aronin, 1992; Collis, Andernach & Van Diepen, 1997; Lai, 1997; Nalley, 1995; Singletary, 1995; Schwartz 1995) had minimum interaction requirements as part of the course. All also mentioned that eventually many students contributed more than the requirements. Schwartz (1995) describes a situation where a question from a student was answered by another student before the instructor saw the question.

The biggest advantage of using the Internet to enhance the delivery of inservice courses is the addition of the diversity of the learner. Traditionally, inservice courses are taught within a school district. Teachers with similar backgrounds, environments and the same administration are taught together. When the subject area is limited (such as home economics or special education) the ability to share ideas is also limited. Graduate courses at local universities combine teachers in diverse situations and allows for a wider exchange of ideas. Internet delivered inservice courses allows for access by a wider range of learners. When enhanced by the interaction possible on the Internet, inservice courses can greatly enrich the exchange of ideas among colleagues and enhance the learning experience of professional educators.

The web-based courses combined with CMC allow learners to learn at their own pace and follow their own path. Time and distance are no longer major roadblocks to the continuing education of teachers.

Web based courses also encourage teachers to use technology by requiring them to use technology. Aronin (1992) describes a project in which inservice and preservice teachers received training in email use. The teachers then were required to write lesson plans that integrated telecommunications into the curriculum.

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CMC can lead to more active and interactive learning, individualization and critical thinking skills. It encourages learning for learning sake. Group based work is more accessible without massive photo copying and scheduling hassles. Peers can review and make suggestions before the product is finalized. It gives students opportunities to articulate and defend their ideas. Web based learning experiences are excellent for portfolio assessment and give students the opportunity to complete a product that would be too large for a single student and prepares the student for team work on the job. (Bazillion & Braun, 1998; Collis, Andernach & Van Diepen, 1997, Schwartz, 1995)

Conclusions

Most of the courses described in this paper used Computer Mediated Communication to supplement in-class activities. If a teacher training course is developed or altered for deliver completely via the Internet, then CMC is an essential element.

One way CMC serves as the foundation for a course delivered via the Internet. The lessons on the Web carry the content for the students to discuss. The Web can also be used by the self-motivated teacher to find materials for lesson plans, student activities and personal enrichment.

The addition of two-way asynchronous communication to a web based course adds a necessary element for staff development. The ability to question and interactive with the instructor and peers is essential in any course taken by an educator. The opportunity to discuss topics and share classroom examples and problems is necessary to teachers learning a new skill.

Two-way synchronous communication may seem trivial, but it adds an important layer to a web based course. The instantaneous exchange of ideas often sparks ideas and gives a different kind of input not capable in the other mediums described in this paper.

Web based teacher training with Computer Mediated Communication is a viable, even attractive, alternative to inservice training. Web delivered courses are like a cake. The instructor delivered material is the cake itself, the foundation. Two-way asynchronous communication methodology is the frosting, essential to any really good cake because it holds the second layer of content in place and makes the whole cake taste good. Two-way interactive technologies in a web based course are like the decorations on top, they are held on by the frosting and though not necessary just a few makes the entire cake look wonderful.

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